ST-JX230L/JX-4060

SERVICE MANUAL

ST-JX230L:
AEP Model
UK Model
G-AEP Model

ST-JX4060:
G-AEP Model

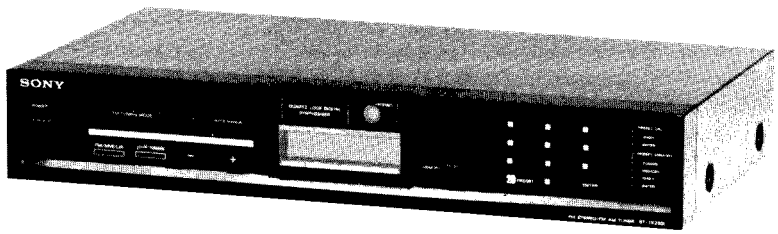


PHOTO: ST-JX230L

SPECIFICATION

Tuner
Circuit system FM stereo, FM/AM superheterodyne Quartz-locked digital synthesizer system

FM tuner
Frequency range 87.5 - 108 MHz
Antenna terminal 300 ohms, balanced: AEP, UK MODEL
75 ohms, unbalanced: G-AEP MODEL
IF 10.7 MHz

	(at 40 kHz deviation)
Sensitivity	at 46 dB quieting 19.5 dBf, 5μV (mono): AEP, UK model 2.5μV (mono): G-AEP model 39.5 dBf, 50μV (stereo): AEP, UK model 25μV (stereo): G-AEP model
Usable sensitivity	11.5 dBf, 2μV (IHF): AEP, UK model 1μV (IHF): G-AEP model
Signal-to-noise ratio	74 dB (mono) 69 dB (stereo)
Hemonic distortion at 1 kHz	0.3% (mono) 0.5% (stereo)
Separation at 1 kHz	40 dB
Frequency response	40 Hz - 12.5 kHz ± 0.5 dB
Selectivity	at 300 kHz 50 dB: AEP, UK model 60 dB: G-AEP model
AM suppression ratio	54 dB
Image response ratio	50 dB: AEP, UK model 80 dB: G-AEP model
IF response ratio	90 dB: AEP, UK model 93 dB: G-AEP model

	(at 40 kHz deviation)
Auto tuning threshold	30 dBf
Output	410mV, 4.7 kΩ (40 kHz dev)

MW/LW tuner section

	MW	LW
Frequency range	522 – 1.611 kHz	144 – 288 kHz
Antenna	Layout-free AM antenna, with external antenna terminal attached	
Intermediate frequency	450 kHz	
Sensitivity	500μV/m (when the Layout-free AM antenna is in use, at 999 kHz.)	700μ/m (when the Layout-free AM antenna is in use, at 230 kHz.)
Signal-to-noise ratio	54 dB	50 dB
Harmonic distortion	0.3%	
Selectivity	35 dB (9 kHz)	

– Continued on next page –

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

FM STEREO/FM-AM TUNER

SONY®

MICROFILM

AUD

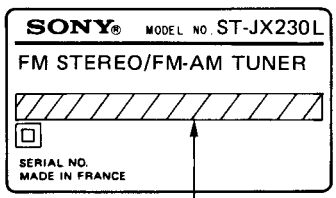
Power and others

Power requirements	
AEP model: 220V ac, 50/60 Hz	
(240V ac adjustable by authorized Sony personnel)	
UK model: 240V ac, 50/60 Hz	
(220V ac adjustable by authorized Sony personnel)	
Power consumption	11 watts
Dimensions	Approx. 430 x 80 x 250mm (w/h/d) (17 x 3 1/4 x 9 7/8 inches)
Weight	Approx. 2.5 kg (5 lb 8 oz)

MODEL IDENTIFICATION

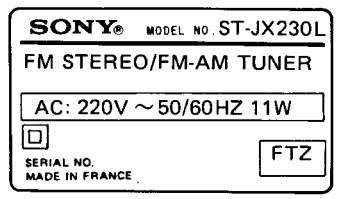
– Specification Labels –

ST-JX230L (AEP, UK model):

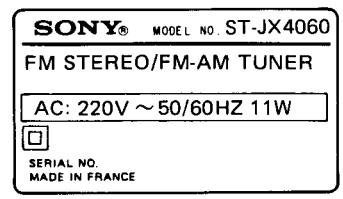


AEP model: AC:220V~50/60Hz 11W
UK model: AC:240V~50/60Hz 11W

ST-JX230L (G-AEP model):

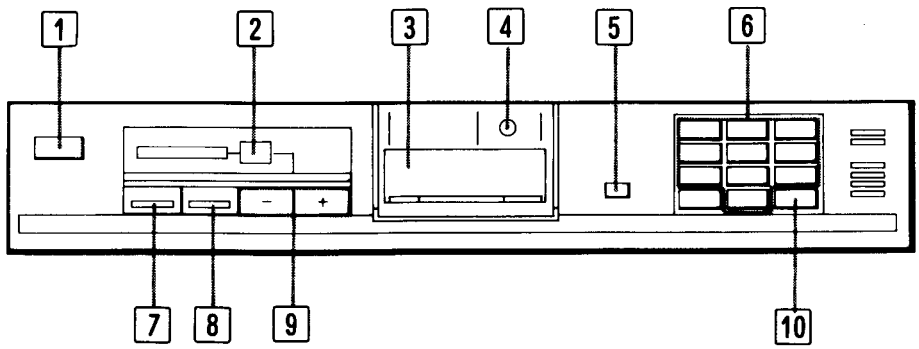


ST-JX4060 (G-AEP model)



FUNCTION OF CONTROLS

Front panel / Panneau avant / Panel frontal



1 POWER switch

2 FM TUNING MODE select button
Press this button to select the manual or auto tuning mode.

3 Display window

4 STERO indicator

5 MEMORY button
Press this button to preset the station.

6 Number buttons
Press this button to enter the preset number.

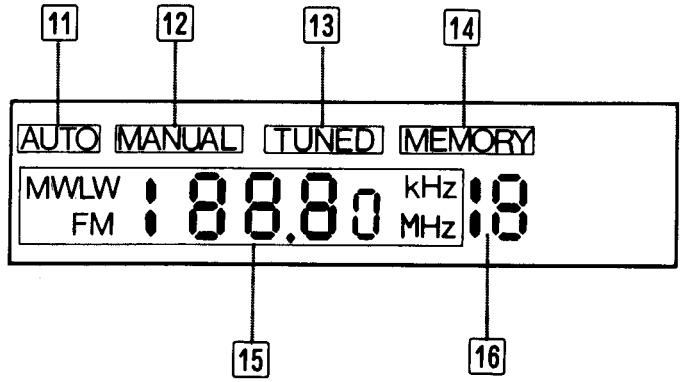
7 BAND select button

8 MEMORY SCAN button
Press this button to sequentially receive broadcasting from the preset stations.

9 TUNING buttons

10 ENTER button
To preset or recall a memorized station, press this button after pressing the appropriate number button.

Display window



11 **Auto tuning indicator**

12 **Manual tuning indicator**

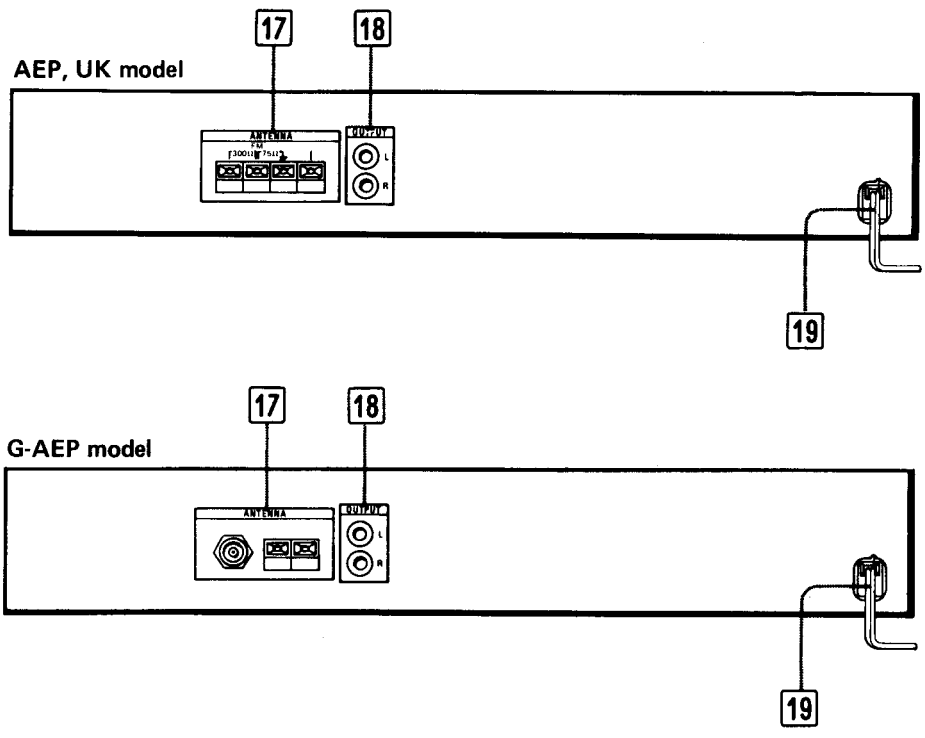
13 **TUNED indicator**

14 **MEMORY indicator**

15 **Band/frequency indicator**

16 **Preset number indicator**

Rear Panel

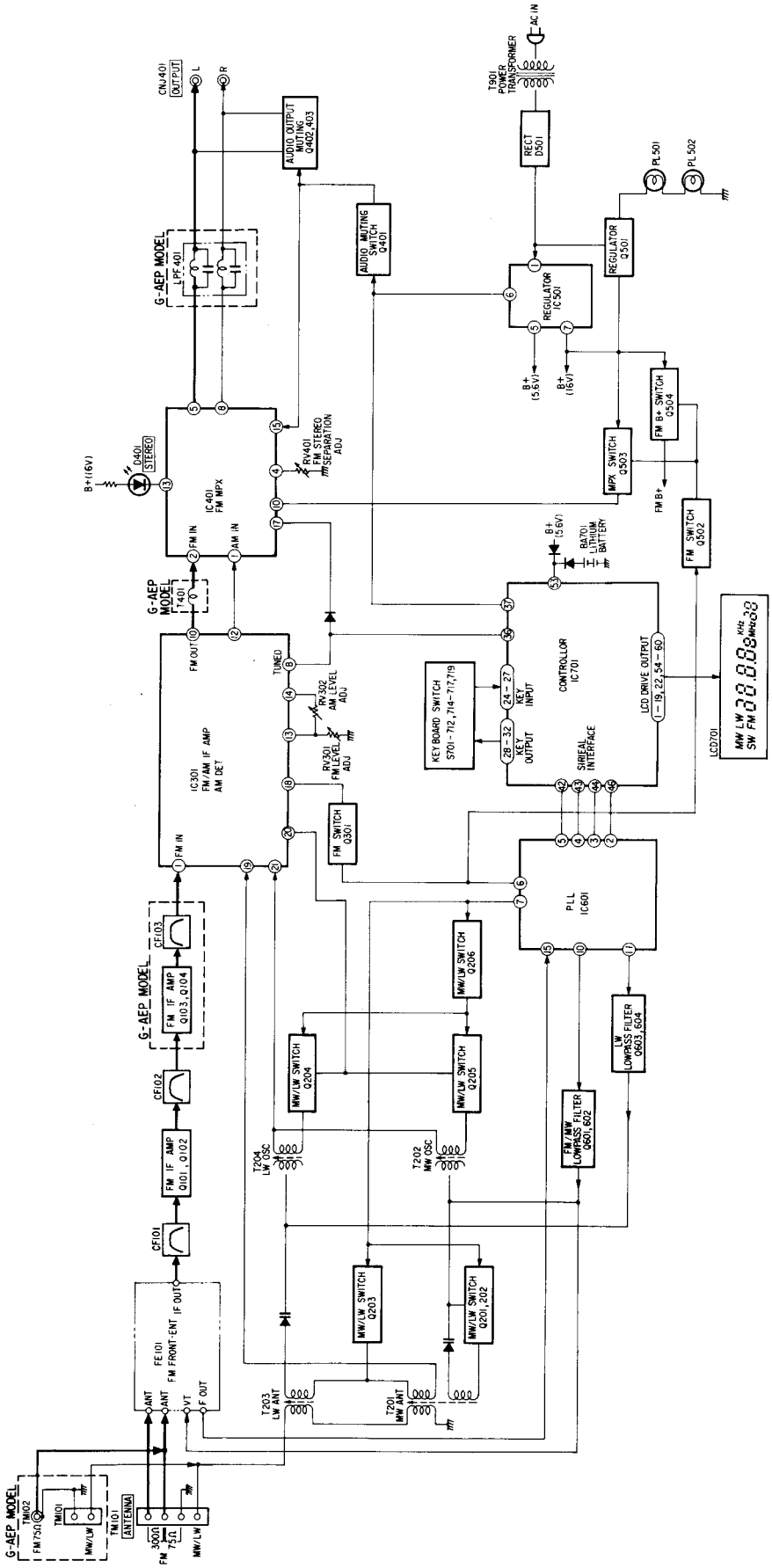


17 **Antenna terminals**

18 **Output jacks**
A jack to be connected to the amplifier.

19 **Power cord**

SECTION 1
BLOCK DIAGRAM

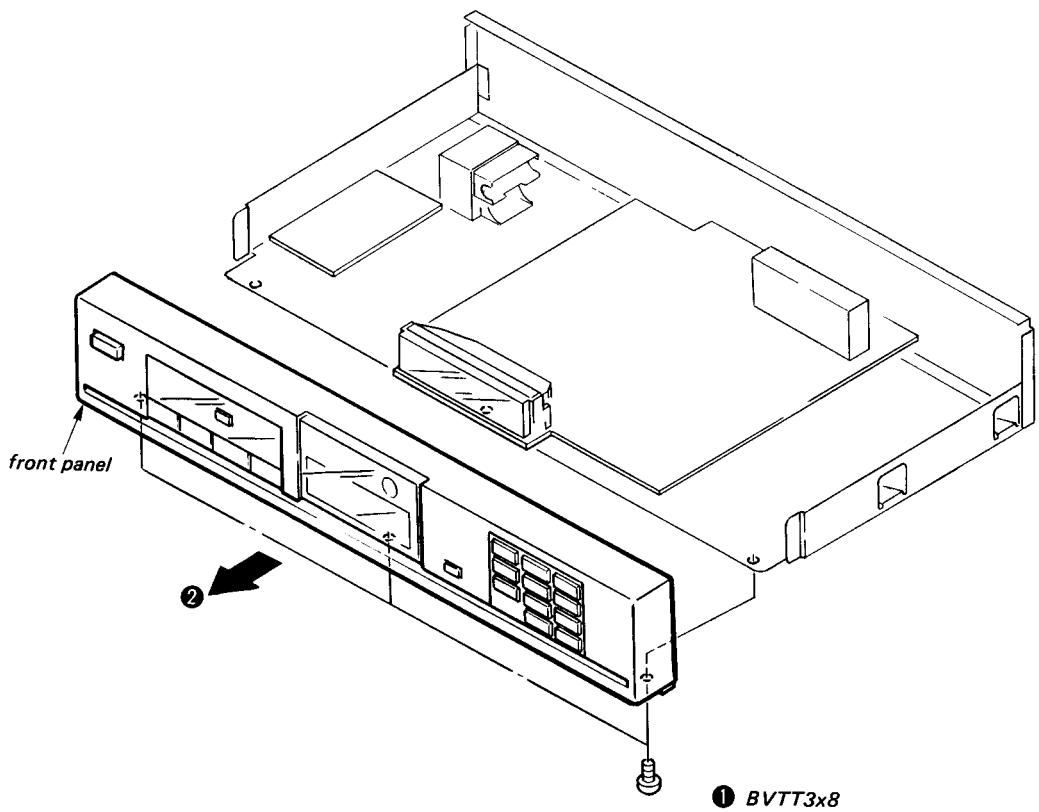


SECTION 2
DISASSEMBLY

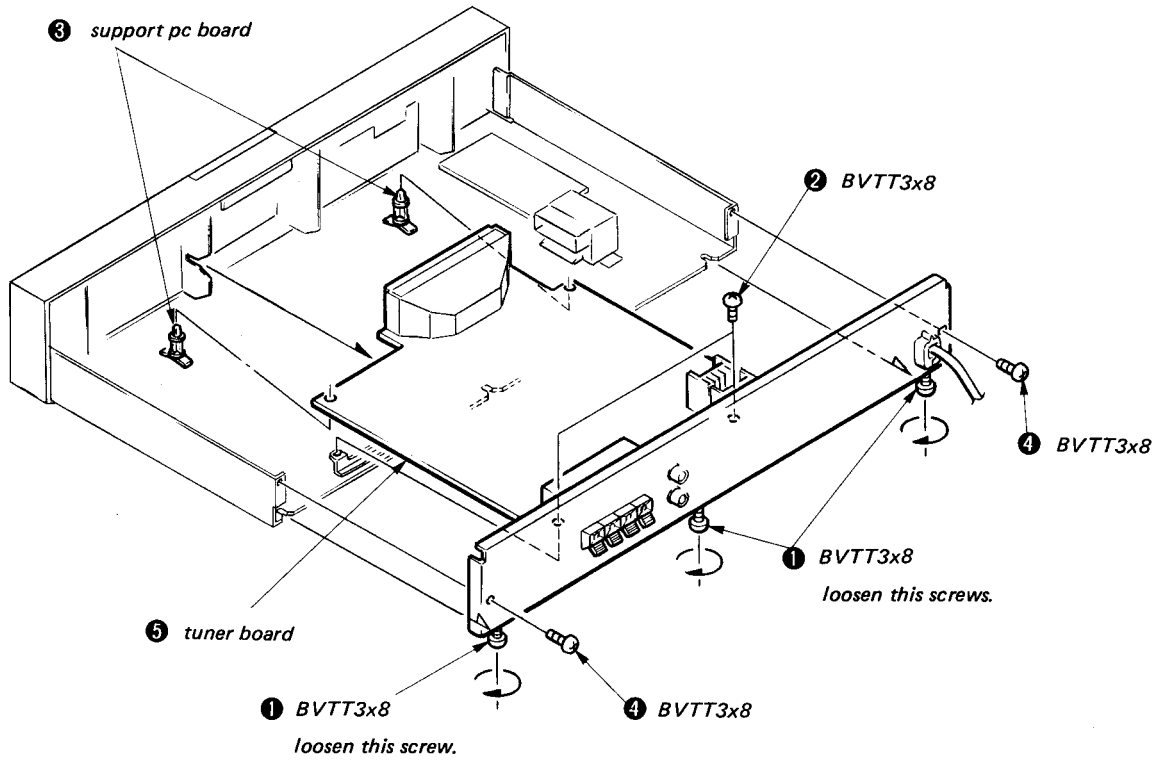
Note: Follow the disassembly procedure in the numerical order given.

CASE REMOVAL
Remove case by taking out four screws.

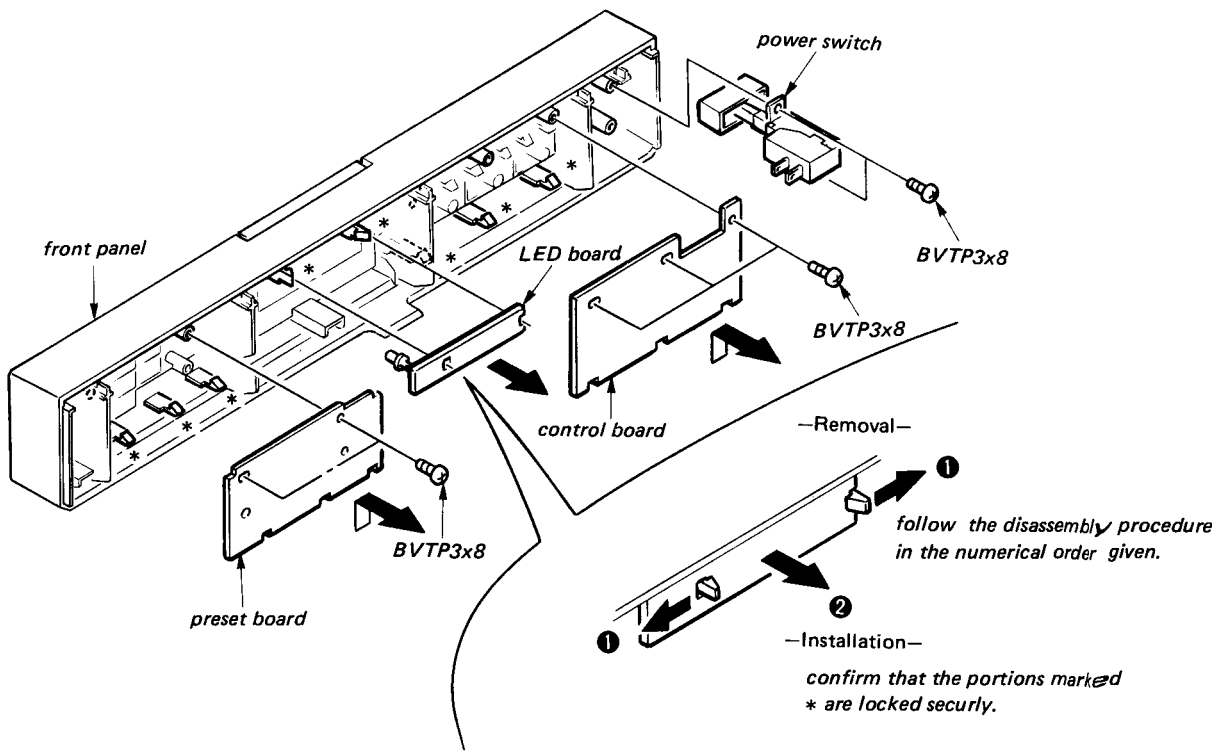
FRONT PANEL



TUNER BOARD



PRESET, LED, CONTROL BOARD AND POWER SWITCH

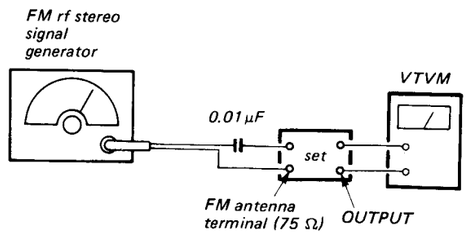


SECTION 3
ADJUSTMENTS

FM SECTION

FM stereo Separation Adjustment

Procedure:



Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Mode: Stereo
Modulation:
Audio (1 kHz): 16.25 kHz deviation (40.6%)
Pilot (19 kHz): 7.5 kHz deviation (20.0%)
Sub-channel (38 kHz): 16.25 kHz deviation (40.6%)

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV401 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV401 for minimum reading.

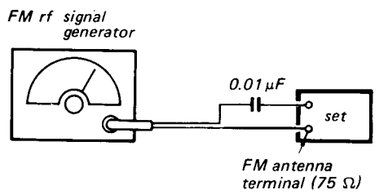
L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

FM Discriminator Alignment

Setting:
BAND select button..... FM

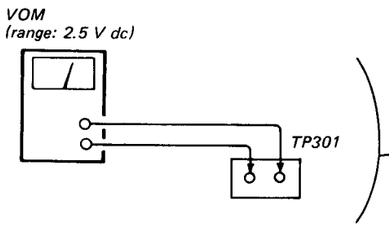
Procedure:

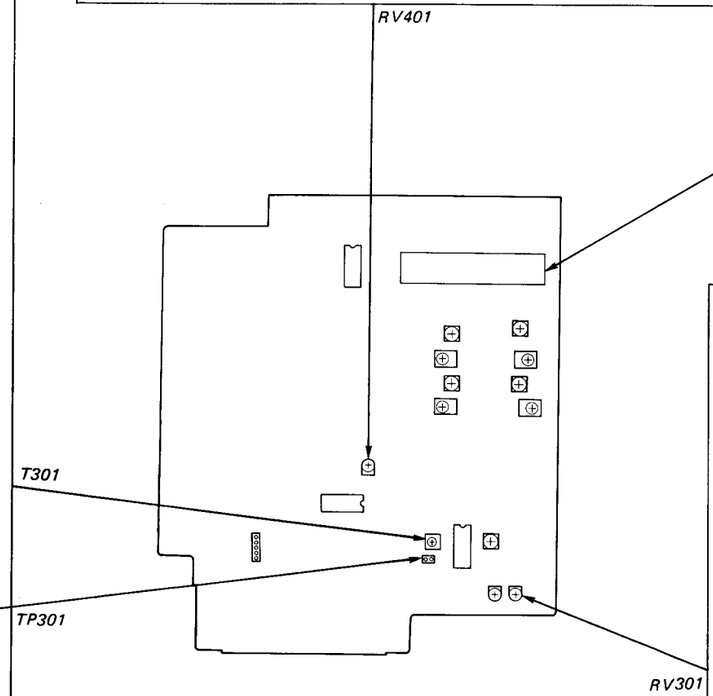


Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Modulation: 1 kHz, 40 kHz deviation (100%)

1. Tune the set to 98 MHz.
2. Adjust T301 for 0 V reading on the VOM..... NULL Adjustment

Note: When the ceramic filter is replaced, these adjustments should be made.

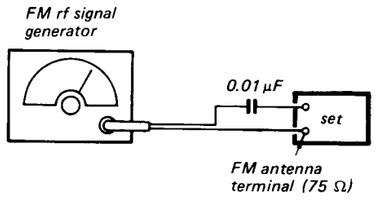




The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement.

FM TUNED Indication Lighting Level Adjustment

Setting:



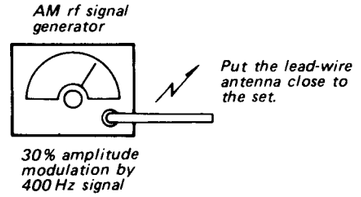
Carrier frequency: 98 MHz
Modulation: 1 kHz, 40 kHz deviation (100%)
Output level: 17.8 µV (25 dB)

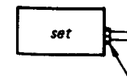
1. Tune the set to 98 MHz.
2. Adjust RV301 so that the TUNED indicator lights up.

MW/LW SECTION

MW adjustment should be performed after LW

Setting:
BAND select button: MW/LW



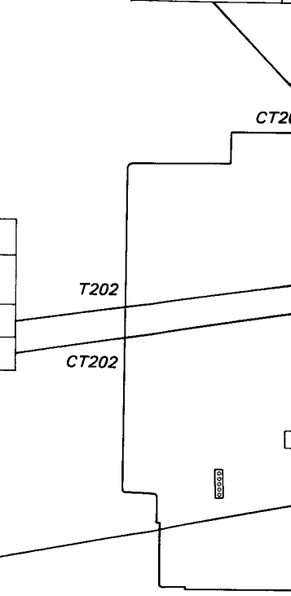


• Repeat the pr
several times, a
tracking adjust
by the trimmer

MW TRACKING
Adjust for a max on VTVM.
1,404 kHz
CT201

AM FREQUENCY COVERAGE ADJUSTMENT		
adjustment part	reading on VOM	frequency indication
T202	1.0 ± 0.2 V	522 kHz
CT202	9 ± 0.4 V	1,611 kHz

AM IF ALIGNMENT
Adjust for a maximum reading on VTVM.
450 kHz
T302



AM TUNED INDICATION LI

BAND select switch: LW
1. Output 50.1mV(94d
generator.
2. Adjust RV302 so that

VTVM

PUT

0.6%)

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV401 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV401 for minimum reading.

L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

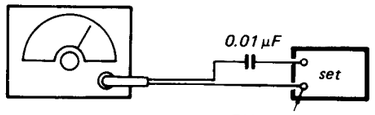
The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement.

RV301

FM TUNED Indication Lighting Level Adjustment

Setting:

FM rf signal generator



FM antenna terminal (75 Ω)

Carrier frequency: 98 MHz
Modulation: 1 kHz, 40 kHz deviation (100%)
Output level: 17.8 μV (25 dB)

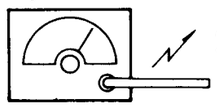
1. Tune the set to 98 MHz.
2. Adjust RV301 so that the TUNED indicator lights up.

MW/LW SECTION **MW adjustment should be performed after LW**

Setting:

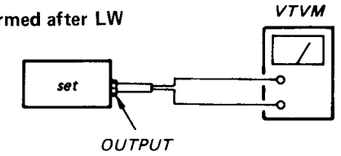
BAND select button: MW/LW

AM rf signal generator



Put the lead-wire antenna close to the set.

30% amplitude modulation by 400 Hz signal



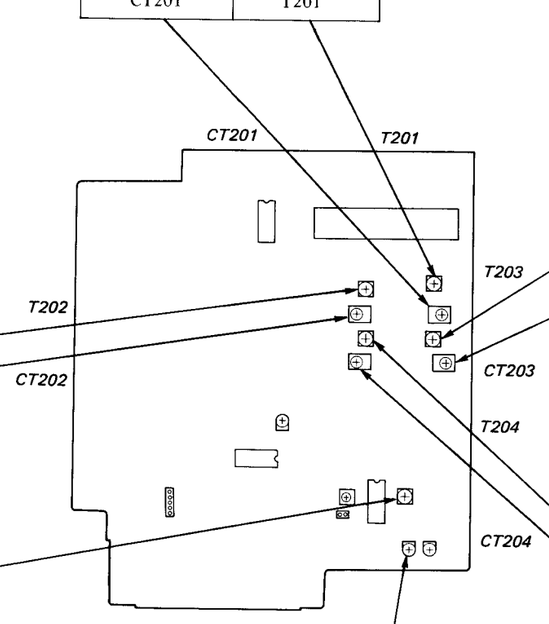
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
1,404 kHz	603 kHz
CT201	T201

LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
162 kHz	270 kHz
T203	CT203

AM FREQUENCY COVERAGE ADJUSTMENT		
adjustment part	reading on VOM	frequency indication
T202	1.0 ± 0.2 V	522 kHz
CT202	9 ± 0.4 V	1,611 kHz

AM IF ALIGNMENT
Adjust for a maximum reading on VTVM.
450 kHz
T302



adjustment part	reading on VOM	frequency indication
T204	1 ± 0.2 V	144 kHz
CT204	9 ± 0.4 V	288 kHz
LW FREQUENCY COVERAGE ADJUSTMENT		

AM TUNED INDICATION LIGHTING LEVEL ADJUSTMENT

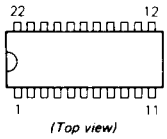
BAND select switch: LW

1. Output 50.1mV(94dB), 216kHz from AM rf signal generator.
2. Adjust RV302 so that the LED lights up.

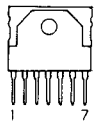
SECTION 4
DIAGRAMS

• Semiconductor Lead Layouts

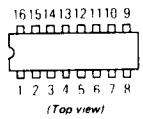
LA1265
LA3401



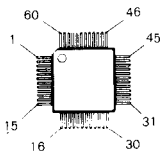
LA5666



TC9172P

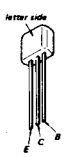


TC9302AF-018

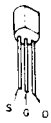


DTA114ES
DTC114ES
2SC2603
2SC2603-F
2SC2669

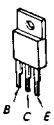
2SA1175



2SC3112-B

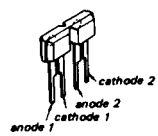


2SD880

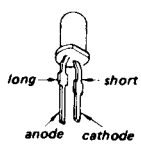


2SK246GR3

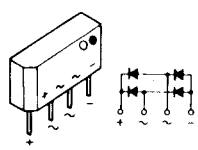
KV1236Z



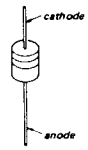
SEL2210W-C



S1VB20



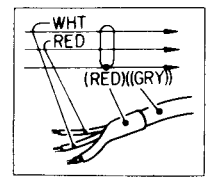
ISS202-1



4-1. MOUNTING DIAGRAM

Note:

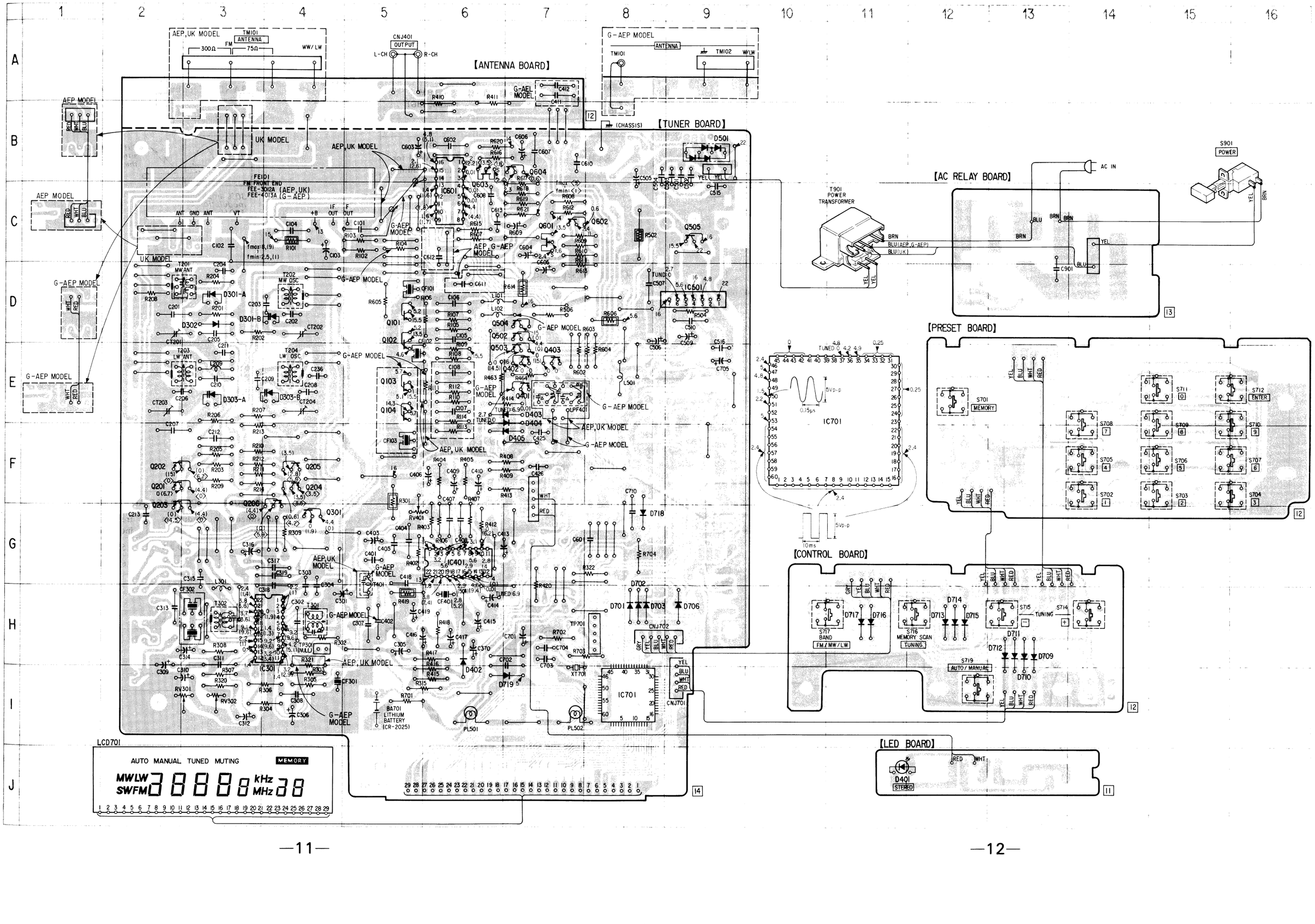
- Color code of sleeving over the end of the jacket.



- ○— : parts extracted from the component side.
- [ ]— : indicates side identified with part number.

• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
IC301	H-4	D301-A	D-3
IC401	G-6	D301-B	D-4
IC501	D-9	D302	D-3
IC601	C-6	D303-A	E-3
IC701	I-8	D303-B	E-4
		D401	J-11
Q101	D-5	D402	H-6
Q102	D-5	D403	E-7
Q103	E-5	D404	E-7
Q104	E-5	D405	F-7
Q201	F-2	D501	B-9
Q202	F-2	D701	H-8
Q203	G-2	D702	H-8
Q204	F-4	D703	H-8
Q205	F-4	D706	H-9
Q206	G-4	D709	H-13
Q301	G-4	D710	H-13
Q401	E-7	D711	H-13
Q402	E-7	D712	H-13
Q403	E-7	D713	H-12
Q502	D-7	D714	H-12
Q503	E-7	D715	H-12
Q504	D-7	D716	H-11
Q505	C-9	D717	H-11
Q601	C-7	D718	G-8
Q602	C-7	D719	I-7
Q603	B-6		
Q604	B-7		


【ANTENNA BOARD】
【TUNER BOARD】
【AC RELAY BOARD】
【PRESET BOARD】
【CONTROL BOARD】
【LED BOARD】
AEP,UK MODEL
G-AEP MODEL
AEP MODEL
UK MODEL
TM101 ANTENNA
FM 300Ω 75Ω
WW/LW
CNJ401 OUTPUT
L-CH R-CH
TM102 WLW
(CHASSIS)
FE101 FM FRONT END FEE-3012A (AEP,UK) FEE-4013A (G-AEP)
IC601
IC401
IC301
IC701
Q601 Q602 Q603 Q604
Q501 Q502 Q503 Q504 Q505
Q101 Q102 Q103 Q104
Q201 Q202 Q203 Q204 Q205 Q206 Q301
Q401 Q402 Q403
D501 D502
D301-A D301-B D302 D303-A D303-B
D401 D402 D403 D404 D405
D701 D702 D703 D706 D709 D710 D711 D712 D714 D715 D716 D717 D718 D719
T201 MW ANT
T202 MW OSC
T203 LW ANT
T204 LW OSC
T301 T302 T401
T901 POWER TRANSFORMER
S901 POWER
AC IN
S701 MEMORY
S702 S703 S704 S705 S706 S707 S708 S709 S710 S711 S712 S714 TUNING S715 S716 MEMORY SCAN S717 BAND S719 AUTO/MANUAL
FM/MW/LW
TUNING
ENTER
BA701 LITHIUM BATTERY (CR-2025)
XT701
TP701
PL501 PL502
CNJ701 CNJ702
LCD701
AUTO MANUAL TUNED MUTING
MEMORY
MWLW SWFM
kHz MHz
BRN BLU YEL WHT RED GRY
BLU(AEP,G-AEP)
BLU(UK)

4-2. SCHEMATIC DIAGRAM

(Refer to page 17 for FM FRONT END schematic diagrams and page 18 for IC block diagrams)

【TUNER BOARD】

AEP,UK MODEL

TM101 ANTENNA
300Ω FM 75Ω
MW/LW

FE101 FM FRONT END
FEE-4013A (G-AEP) OUT
FEE-3012A (AEP,UK)
ANT ANT F OUT VT IF

G-AEP MODEL

TM101 FM ANTENNA
TM102 MW/LW

Q101,102 2SC2669 FM IF AMP
Q103,104 2SC2669 FM IF AMP

D303 KV1236Z
Q203 DTC114ES MW/LW SWITCH

Q204 2SC2458 MW/LW SWITCH
Q205 2SA1048 MW/LW SWITCH
Q206 DTC114ES MW/LW SWITCH

D301 KV1236Z
Q201,202 DTC114ES MW/LW SWITCH
D302 ISS202

Q601 2SK246GR3 LOWPASS FILTER
Q602 2SC3112 FM/MW LOWPASS FILTER
Q604 2SC3112 LW LOWPASS FILTER
Q603 2SK246GR3 LOWPASS FILTER

IC601 TC9172P PLL

AEP,G-AEP MODEL

TP701

Q301 DTC144ES FM SWITCH

IC301 LA1265 FM IF/AM DET

D402 ISS202

【CONTROL BOARD】【PRESET BOARD】

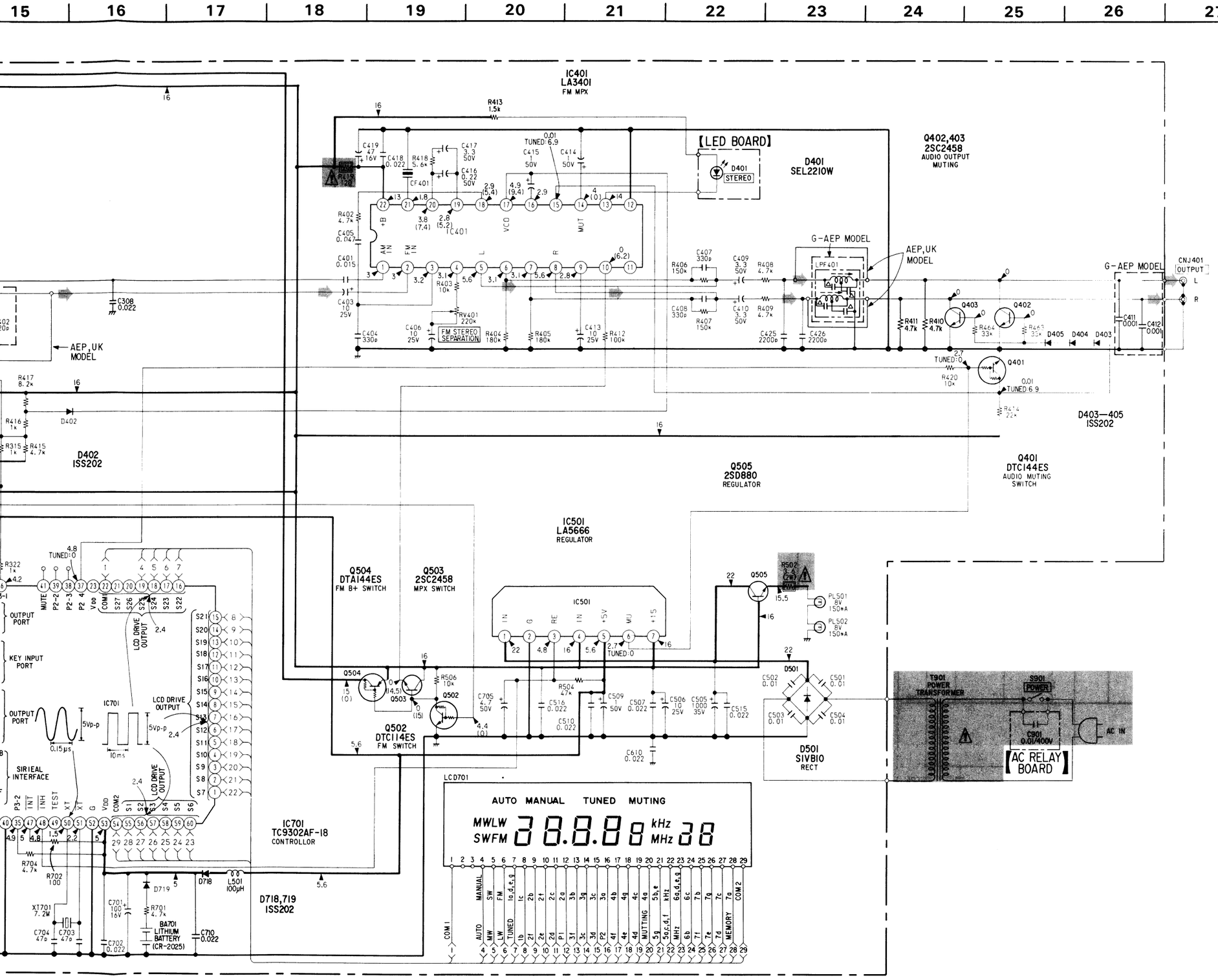
D709—717 ISS202
D701—703,706 ISS202

P3-1 OUTPUT PORT / KEY INPUT PORT / OUTPUT PORT / SIRIEAL INTERFACE
P3-2

IC701

XT701 7.2M

BA701 LITHIUM BATTERY (CR-2025)



Note:

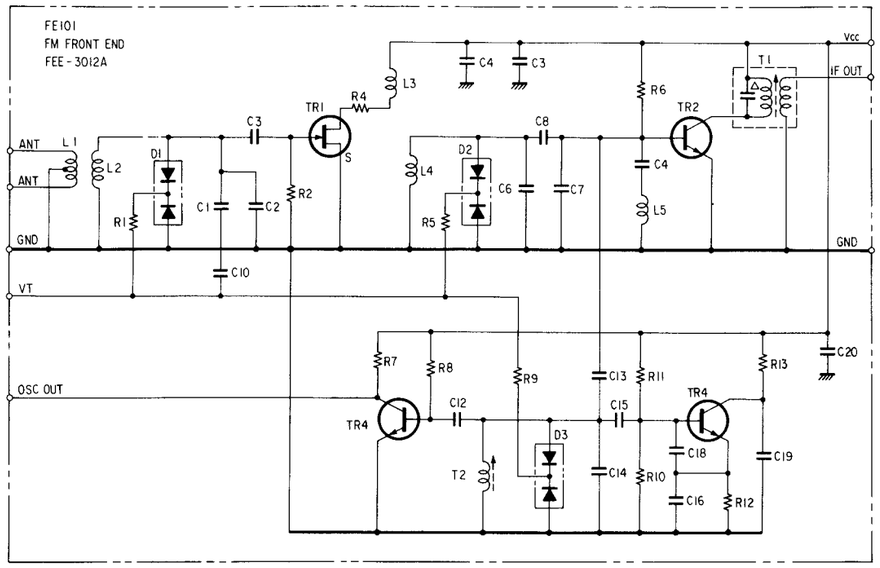
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▷ : signal path.
- △ : internal component.
- ▭ : nonflammable resistor.
- ▬ : B+ bus.
- □ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
  no mark: FM
  ( ) : MW
  < >: LW
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in detuned mode by using oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Switch

Ref. No.	Switch	Position
S701	MEMORY	OFF
S702	1	OFF
S703	2	OFF
S704	3	OFF
S705	4	OFF
S706	5	OFF
S707	6	OFF
S708	7	OFF
S709	8	OFF
S710	9	OFF
S711	0	OFF
S712	ENTER	OFF
S714	+	OFF
S715	−	OFF
S716	MEMORY SCAN	OFF
S717	FM/MW/LW	OFF
S719	AUTO/MANU	OFF
S901	POWER	OFF

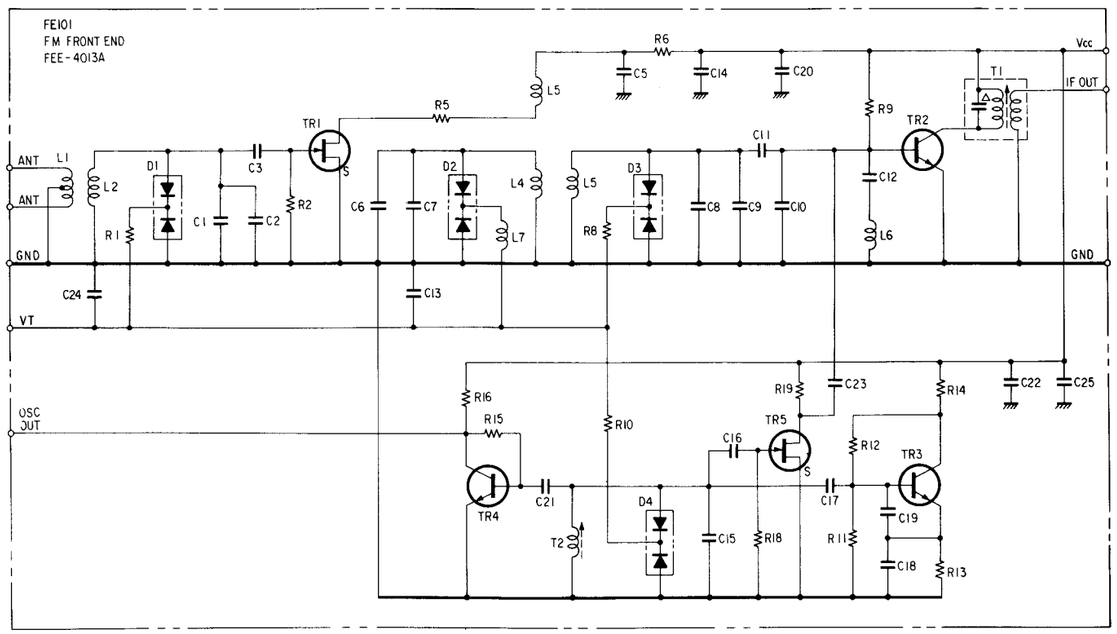
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-3. FM FRONT END SCHEMATIC DIAGRAMS

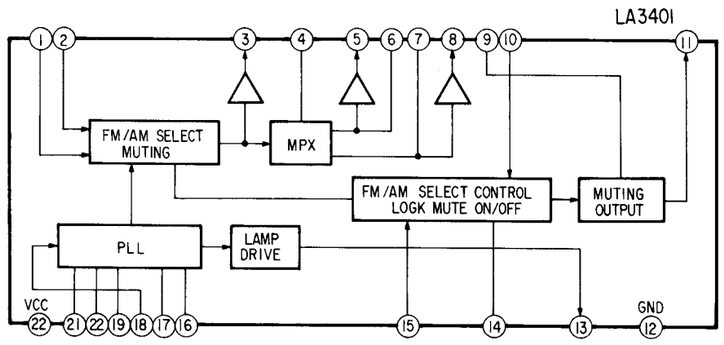
AEP, UK model :

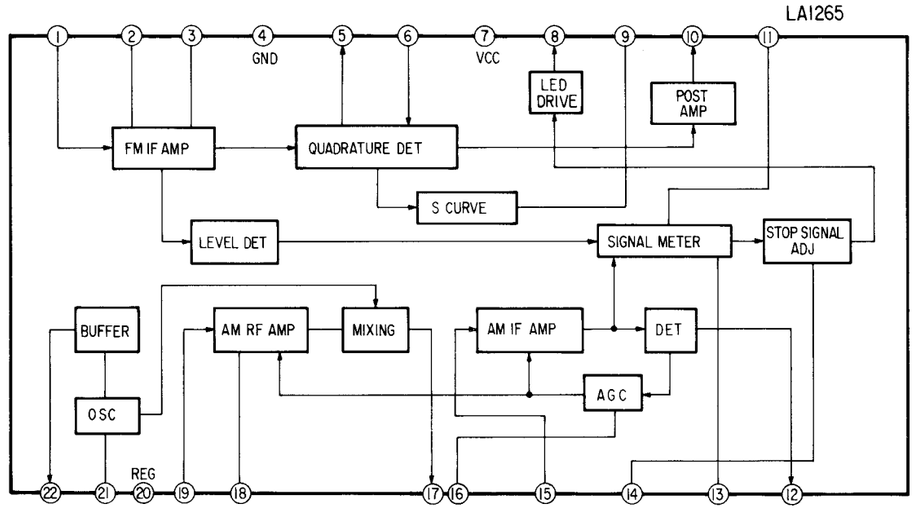


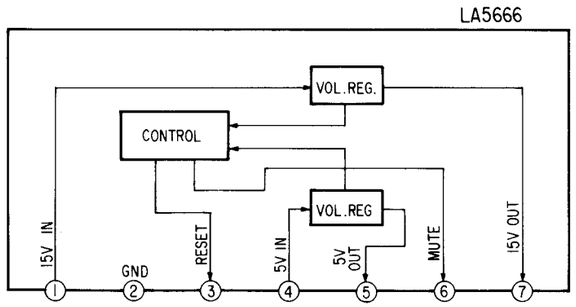
G-AEP model :



IC BLOCK DIAGRAMS



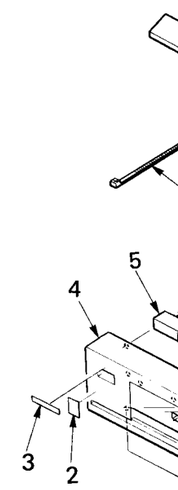




NOTE:
The mechanical part
number in the explo
supplied.

· Items marked " ★ "
they are seldom re
service. Some del
pated when orderin

5-1.



No.	Part No.
1	7-685-752-04
2	3-703-713-41
3	3-701-690-00
4	X-4904-242-1
	X-4904-524-1
5	3-332-417-11
	3-332-417-31
6	7-685-646-71
7	4-886-821-01
8	4-905-463-41
	4-905-463-51
9	4-905-294-41
10	4-905-294-21
11	4-905-294-01
12	4-905-294-11

SECTION 5
EXPLODED VIEWS AND PARTS LIST

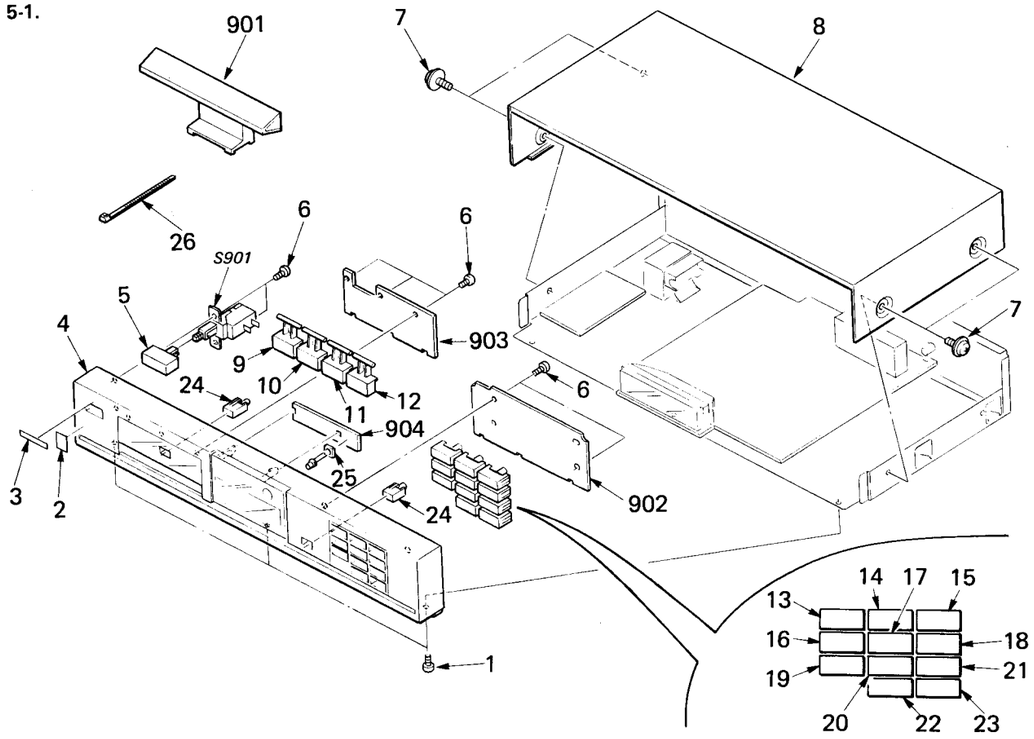
NOTE:
The mechanical parts with no reference number in the exploded views are not supplied.

· Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

· The construction parts of an assembled part are indicated with a collation number in the remark column.

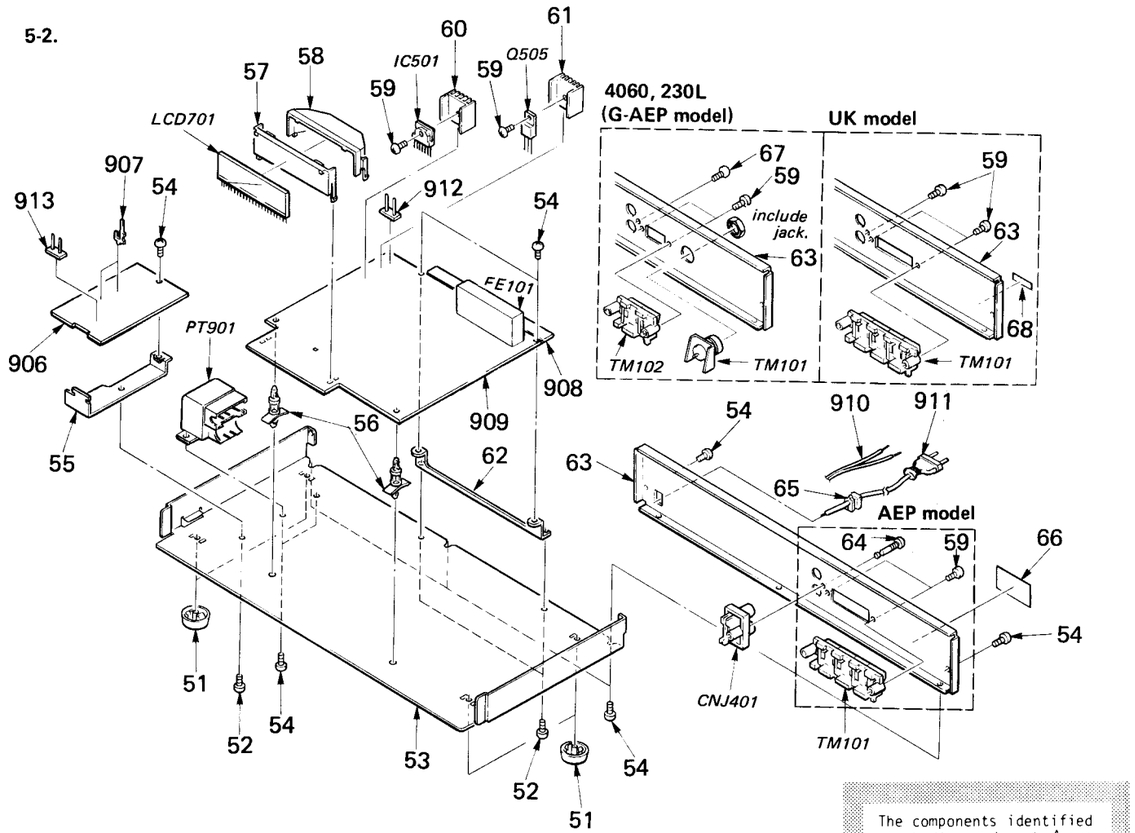
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-1.



No.	Part No.	Description	Remarks
1	7-685-752-04	SCREW +BVTT 3X8 (S)	
2	3-703-713-41	STICKER, SONY SYMBOL (10)	
3	3-701-690-00	(UK)...LABEL MADE IN JAPAN	
4	X-4904-242-1	(ST-JX230L)...PANEL ASSY, FRONT	
	X-4904-524-1	(ST-JX4060)...PANEL ASSY, FRONT	
5	3-332-417-11	(ST-JX230L)...KNOB (POWER), PUSH	
	3-332-417-31	(ST-JX4060)...KNOB (POWER), PUSH	
6	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
7	4-886-821-01	SCREW, M3 CASE	
8	4-905-463-41	(ST-JX230L)...CASE	
	4-905-463-51	(ST-JX4060)...CASE	
9	4-905-294-41	PUSH KNOB (FM/MW/LW)	
10	4-905-294-21	PUSH KNOB (TUNING)	
11	4-905-294-01	PUSH KNOB (-)	
12	4-905-294-11	PUSH KNOB (+)	
13	4-905-295-01	PUSH KNOB (1)	
14	4-905-295-11	PUSH KNOB (2)	
15	4-905-295-21	PUSH KNOB (3)	
16	4-905-295-31	PUSH KNOB (4)	
17	4-905-295-41	PUSH KNOB (5)	
18	4-905-295-51	PUSH KNOB (6)	
19	4-905-295-61	PUSH KNOB (7)	
20	4-905-295-71	PUSH KNOB (8)	
21	4-905-295-81	PUSH KNOB (9)	
22	4-905-295-91	PUSH KNOB (0)	
23	4-905-296-01	PUSH KNOB (INTER)	
24	4-905-275-01	KNOB, PUSH	
25	4-905-207-01	(ST-JX230L)...CUSHION, LAMP	
26	3-701-748-00	CLAMP	
901	1-402-082-11	ANTENNA, FERRITE-ROD(LW/MW/SW)	
902	*1-618-866-11	PC BOARD, PRESET	
903	*1-618-867-11	PC BOARD, CONTROL	
904	*1-618-354-11	PC BOARD, LED	
S901	⚠.1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)	

5-2.



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remarks
51	X-3701-069-0	FOOT ASSY, M.F	
52	7-685-871-01	SCREW +BVTT 3X6 (S)	
53	*4-904-481-11	CHASSIS	
54	7-685-752-04	SCREW +BVTT 3X8 (S)	
55	*4-902-812-01	HOLDER, FUSE PC BOARD	
56	*3-703-353-05	SUPPORT, PC BOARD	
57	*4-909-633-01	ILLUMINATOR	
58	*4-904-515-01	HOUSE, LAMP	
59	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
60	*4-363-146-51	HEAT SINK, V.OUT	
61	*4-363-146-41	HEAT SINK, V.OUT	
62	*4-905-284-01	FRAME	
63	*4-905-272-21	(AEP).....PLATE, JACK	
	*4-905-272-41	(UK).....PLATE, JACK	
	*4-905-272-61	(ST-JX230L:G-AEP)...PLATE, JACK	
	*4-905-272-81	(ST-JX4060).....PLATE, JACK	
64	3-703-473-00	(AEP)....SCREW TERMINAL	
65	3-703-244-00	BUSHING (2104), CORD	
66	4-905-276-01	(AEP)...LABEL, MODEL NUMBER	
67	4-909-982-11	(G-AEP)...SCREW, TAPPING	
68	3-703-079-21	(UK)...LABEL, CAUTION (BACK)	
906	*1-618-869-11	PC BOARD, AC RELAY	
907	*1-535-416-00	TERMINAL	
908	*1-618-352-11	PC BOARD, ANTENNA	
909	*A-4351-516-A	(AEP).....MOUNTED PCB, TUNER	
	*A-4351-517-A	(ST-JX230L:G-AEP)...MOUNTED PCB, TUNER	
	*A-4351-518-A	(UK).....MOUNTED PCB, TUNER	
	*A-4351-534-A	(ST-JX4060).....MOUNTED PCB, TUNER	
910	⚠.1-556-560-00	(UK)...CORD, POWER	
911	⚠.1-534-817-XX	(EXCEPT FOR UK)...CORD, POWER, EULO PLUG	
912	*1-535-115-00	TERMINAL	
913	1-535-139-11	BASE POST	
CNJ401	1-507-807-11	(AEP,UK)...JACK, PIN 2P	
CNJ401	1-507-997-11	(G-AEP)....JACK, PIN 2P	
FE101	1-463-609-11	(AEP,UK)...FRONT END, FM (FEE-3012A)	
FE101	1-463-611-11	(G-AEP)....FRONT END, FM (FEE-4013A)	
LCD701	1-807-453-11	DISPLAY PANEL, LIQUID CRYSTAL	
T901	⚠.1-448-422-11	TRANSFORMER, POWER	
TM101	1-563-199-11	(G-AEP)....CONNECTOR, PAL	
TM101	1-536-708-00	(AEP,UK)...TERMINAL BOARD, PUSH 4P	
TM102	1-536-707-00	(G-AEP)....TERMINAL BOARD, PUSH 2P	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

· Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

· If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
· All resistors are in ohms.
· F : nonflammable

COILS
· MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-402-082-11	ANTENNA, FERRITE-ROD (LW/MW/SW)
902	*1-618-866-11	PC BOARD, PRESET
903	*1-618-867-11	PC BOARD, CONTROL
904	*1-618-354-11	PC BOARD, LED
906	*1-618-869-11	PC BOARD, AC RELAY
907	*1-535-416-00	TERMINAL
908	*1-618-352-11	PC BOARD, ANTENNA
909	*A-4351-516-A	(AEP).....MOUNTED PCB, TUNER
	*A-4351-517-A	(ST-JX230L:G-AEP)...MOUNTED PCB, TUNER
	*A-4351-518-A	(UK).....MOUNTED PCB, TUNER
	*A-4351-534-A	(ST-JX4060).....MOUNTED PCB, TUNER
910 ⚠	1-556-560-00	(UK)...CORD, POWER
911 ⚠	1-534-817-XX	(EXCEPT FOR UK)..CORD, POWER, EULO PLUG
912	*1-535-115-00	TERMINAL
913	1-535-139-11	BASE POST
BA701	1-528-120-00	BATTERY, LITHIUM (CR-2025)
C101	1-162-294-31	CERAMIC 0.001MF 10% 50V
C102	1-162-294-31	CERAMIC 0.001MF 10% 50V
C103	1-123-332-00	ELECT 47MF 20% 16V
C104	1-161-494-00	CERAMIC 0.022MF 30% 25V
C105	1-161-494-00	CERAMIC 0.022MF 30% 25V
C106	1-161-494-00	CERAMIC 0.022MF 30% 25V
C107	1-161-494-00	(G-AEP)...CERAMIC 0.022MF 30% 25V
C108	1-161-494-00	(G-AEP)...CERAMIC 0.022MF 30% 25V
C201	1-161-494-00	CERAMIC 0.022MF 30% 25V
C202	1-102-880-00	CERAMIC 15PF 5% 50V
C203	1-104-069-00	POLYSTYRENE 470PF 5% 50V
C204	1-101-006-00	CERAMIC 0.047MF 50V
C205	1-161-494-00	CERAMIC 0.022MF 30% 25V
C206	1-101-888-00	CERAMIC 68PF 5% 50V
C207	1-161-494-00	CERAMIC 0.022MF 30% 25V
C208	1-102-703-21	CERAMIC 120PF 5% 50V
C209	1-104-060-00	POLYSTYRENE 200PF 5% 50V
C210	1-162-301-31	CERAMIC 0.0015MF 30% 16V
C211	1-102-120-00	CERAMIC 0.0018MF 10% 50V
C212	1-161-494-00	CERAMIC 0.022MF 30% 25V
C213	1-101-006-00	CERAMIC 0.047MF 50V
C236	1-101-971-00	CERAMIC 15PF 5% 50V
C301	1-123-332-00	ELECT 47MF 20% 16V
C302	1-161-494-00	CERAMIC 0.022MF 30% 25V
C303	1-101-006-00	CERAMIC 0.047MF 50V
C304	1-101-006-00	CERAMIC 0.047MF 50V
C305	1-123-382-00	ELECT 3.3MF 20% 50V
C306	1-123-380-00	ELECT 1MF 20% 50V
C307	1-162-211-31	(AEP,UK)...CERAMIC 33PF 5% 50V
C307	1-162-290-31	(G-AEP)....CERAMIC 470PF 10% 50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C308	1-161-494-00	CERAMIC 0.022MF 30% 25V
C309	1-123-382-00	ELECT 3.3MF 20% 50V
C310	1-123-382-00	ELECT 3.3MF 20% 50V
C311	1-161-494-00	CERAMIC 0.022MF 30% 25V
C312	1-123-382-00	ELECT 3.3MF 20% 50V
C313	1-162-215-31	CERAMIC 47PF 5% 50V
C314	1-123-369-00	ELECT 4.7MF 20% 50V
C315	1-101-006-00	CERAMIC 0.047MF 50V
C316	1-123-356-00	ELECT 10MF 20% 25V
C317	1-161-494-00	CERAMIC 0.022MF 30% 25V
C318	1-162-207-31	CERAMIC 22PF 5% 50V
C319	1-161-494-00	CERAMIC 0.022MF 30% 25V
C370	1-123-369-00	ELECT 4.7MF 20% 50V
C401	1-108-583-00	MYLAR 0.015MF 5% 50V
C402	1-162-286-31	(G-AEP)...CERAMIC 220PF 10% 50V
C403	1-123-356-00	ELECT 10MF 20% 25V
C404	1-162-288-31	CERAMIC 330PF 10% 50V
C405	1-108-595-00	MYLAR 0.047MF 5% 50V
C406	1-123-356-00	ELECT 10MF 20% 25V
C407	1-162-288-31	CERAMIC 330PF 10% 50V
C408	1-162-288-31	CERAMIC 330PF 10% 50V
C409	1-123-382-00	ELECT 3.3MF 20% 50V
C410	1-123-382-00	ELECT 3.3MF 20% 50V
C411	1-162-294-31	(G-AEP)...CERAMIC 0.001MF 10% 50V
C412	1-162-294-31	(G-AEP)...CERAMIC 0.001MF 10% 50V
C413	1-123-356-00	ELECT 10MF 20% 25V
C414	1-123-380-00	ELECT 1MF 20% 50V
C415	1-123-380-00	ELECT 1MF 20% 50V
C416	1-123-608-00	ELECT 0.22MF 20% 50V
C417	1-123-382-00	ELECT 3.3MF 20% 50V
C418	1-161-494-00	CERAMIC 0.022MF 30% 25V
C419	1-123-332-00	ELECT 47MF 20% 16V
C425	1-102-121-00	CERAMIC 0.0022MF 10% 50V
C426	1-102-121-00	CERAMIC 0.0022MF 10% 50V
C501	1-101-004-00	CERAMIC 0.01MF 50V
C502	1-101-004-00	CERAMIC 0.01MF 50V
C503	1-101-004-00	CERAMIC 0.01MF 50V
C504	1-101-004-00	CERAMIC 0.01MF 50V
C505	1-124-901-00	ELECT 1000MF 20% 35V
C506	1-123-356-00	ELECT 10MF 20% 25V
C507	1-161-494-00	CERAMIC 0.022MF 30% 25V
C509	1-123-380-00	ELECT 1MF 20% 50V
C510	1-161-494-00	CERAMIC 0.022MF 30% 25V
C515	1-101-005-00	CERAMIC 0.022MF 50V
C516	1-101-005-00	CERAMIC 0.022MF 50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C601	1-161-494-00	CERAMIC	0.022MF	30%	25V
C602	1-161-494-00	CERAMIC	0.022MF	30%	25V
C603	1-123-356-00	ELECT	10MF	20%	25V
C604	1-123-379-00	ELECT	0.47MF	20%	50V
C605	1-123-379-00	ELECT	0.47MF	20%	50V
C606	1-123-332-00	ELECT	47MF	20%	16V
C607	1-161-494-00	CERAMIC	0.022MF	30%	25V
C608	1-130-776-00	FILM	0.47MF	5%	63V
C609	1-123-607-00	ELECT	0.1MF	20%	50V
C610	1-101-005-00	CERAMIC	0.022MF		50V
C611	1-101-005-00	(AEP,G-AEP)..CERAMIC	0.022MF		50V
C612	1-101-005-00	(AEP,G-AEP)..CERAMIC	0.022MF		50V
C613	1-101-005-00	CERAMIC	0.022MF		50V
C701	1-123-333-00	ELECT	100MF	20%	16V
C702	1-161-494-00	CERAMIC	0.022MF	30%	25V
C703	1-102-852-00	CERAMIC	47PF	5%	50V
C704	1-102-852-00	CERAMIC	47PF	5%	50V
C705	1-123-369-00	ELECT	4.7MF	20%	50V
C710	1-161-494-00	CERAMIC	0.022MF	30%	25V
C901 ⚠	1-161-744-00	CERAMIC	0.01MF		400V
CF101	1-567-389-11	FILTER, CERAMIC			
CF102	1-567-389-11	(G-AEP)...FILTER, CERAMIC			
CF103	1-567-389-11	(G-AEP)...FILTER, CERAMIC			
CF301	1-527-981-00	FILTER, CERAMIC			
CF302	1-527-937-00	FILTER, CERAMIC			
CF401	1-567-250-11	OSCILLATOR, CERAMIC			
CNJ401	1-507-807-11	(AEP,UK)...JACK, PIN 2P			
CNJ401	1-507-997-11	(G-AEP)....JACK, PIN 2P			
CNJ701*	1-564-507-11	PLUG, CONNECTOR 4P			
CNJ702*	1-564-508-11	PLUG, CONNECTOR 5P			
CT201	1-141-180-00	CAP, TRIMMER 15P			
CT202	1-141-180-00	CAP, TRIMMER 15P			
CT203	1-141-171-00	CAP, TRIMMER 20P			
CT204	1-141-171-00	CAP, TRIMMER 20P			
D301	8-719-902-79	DIODE KV1236Z			
D302	8-719-107-94	DIODE 1SS202-1			
D303	8-719-902-79	DIODE KV1236Z			
D401	8-719-302-74	DIODE SEL2210W-C			
D402	8-719-107-94	DIODE 1SS202-1			
D403	8-719-107-94	DIODE 1SS202-1			
D404	8-719-107-94	DIODE 1SS202-1			
D405	8-719-107-94	DIODE 1SS202-1			
D501	8-719-511-20	DIODE S1VB20			
D701	8-719-107-94	DIODE 1SS202-1			
D702	8-719-107-94	DIODE 1SS202-1			
D703	8-719-107-94	DIODE 1SS202-1			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D706	8-719-107-94	DIODE 1SS202-1
D709	8-719-107-94	DIODE 1SS202-1
D710	8-719-107-94	DIODE 1SS202-1
D711	8-719-107-94	DIODE 1SS202-1
D712	8-719-107-94	DIODE 1SS202-1
D713	8-719-107-94	DIODE 1SS202-1
D714	8-719-107-94	DIODE 1SS202-1
D715	8-719-107-94	DIODE 1SS202-1
D716	8-719-107-94	DIODE 1SS202-1
D717	8-719-107-94	DIODE 1SS202-1
D718	8-719-107-94	DIODE 1SS202-1
D719	8-719-107-94	DIODE 1SS202-1
FE101	1-463-609-11	(AEP,UK)...FRONT END, FM (FEE-3012A)
FE101	1-463-611-11	(G-AEP)....FRONT END, FM (FEE-4013A)
IC301	8-759-801-81	IC LA1265
IC401	8-759-801-80	IC LA3401
IC501	8-759-802-61	IC LA5666
IC601	8-759-202-63	IC TC9172P
IC701	8-759-207-45	IC TC9302AF-018
L101	1-410-564-21	MICRO INDUCTOR 100UH
L102	1-410-564-21	MICRO INDUCTOR 100UH
L209	1-410-568-21	MICRO INDUCTOR 220UH
L301	1-408-920-00	MICRO INDUCTOR 4.7MMH
L501	1-410-564-21	MICRO INDUCTOR 100UH
LCD701	1-807-453-11	DISPLAY PANEL, LIQUID CRYSTAL
LPF401	1-235-221-00	(G-AEP)...FILTER, LOW PASS
PL501	1-518-576-31	LAMP, PILOT
PL502	1-518-576-31	LAMP, PILOT
Q101	8-729-266-93	TRANSISTOR 2SC2669
Q102	8-729-266-93	TRANSISTOR 2SC2669
Q103	8-729-266-93	(G-AEP)...TRANSISTOR 2SC2669
Q104	8-729-266-93	(G-AEP)...TRANSISTOR 2SC2669
Q201	8-729-900-80	TRANSISTOR DTC114ES
Q202	8-729-900-80	TRANSISTOR DTC114ES
Q203	8-729-900-80	TRANSISTOR DTC114ES
Q204	8-729-606-33	TRANSISTOR 2SC2603F
Q205	8-729-117-54	TRANSISTOR 2SA1175
Q206	8-729-900-80	TRANSISTOR DTC114ES
Q301	8-729-900-80	TRANSISTOR DTC114ES
Q401	8-729-900-80	TRANSISTOR DTC114ES
Q402	8-729-606-33	TRANSISTOR 2SC2603F
Q403	8-729-606-33	TRANSISTOR 2SC2603F
Q502	8-729-900-80	TRANSISTOR DTC114ES

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ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q503	8-729-606-33	TRANSISTOR 2SC2603F				
Q504	8-729-900-65	TRANSISTOR DTA114ES				
Q505	8-729-288-02	TRANSISTOR 2SD880				
Q601	8-729-202-67	TRANSISTOR 2SK246GR3				
Q602	8-729-201-84	TRANSISTOR 2SC3112-B				
Q603	8-729-202-67	TRANSISTOR 2SK246GR3				
Q604	8-729-201-84	TRANSISTOR 2SC3112-B				
R101 ⚠	1-247-704-11	CARBON	220	5%	1/4W	F
R102	1-247-819-00	(AEP,UK)...CARBON	330	5%	1/6W	
R102	1-247-821-00	(G-AEP)....CARBON	390	5%	1/6W	
R103	1-247-819-00	(AEP,UK)...CARBON	330	5%	1/6W	
R103	1-249-417-11	(G-AEP)....CARBON	1K	5%	1/6W	
R104	1-247-821-00	(G-AEP)....CARBON	390	5%	1/6W	
R105	1-249-432-11	CARBON	18K	5%	1/6W	
R106	1-247-819-00	CARBON	330	5%	1/6W	
R107	1-249-414-11	CARBON	560	5%	1/6W	
R108	1-247-819-00	CARBON	330	5%	1/6W	
R109	1-249-434-11	CARBON	27K	5%	1/6W	
R110	1-249-432-11	(G-AEP)...CARBON	18K	5%	1/6W	
R111	1-247-819-00	(G-AEP)...CARBON	330	5%	1/6W	
R112	1-247-829-00	(G-AEP)...CARBON	820	5%	1/6W	
R113	1-247-819-00	(G-AEP)...CARBON	330	5%	1/6W	
R114	1-249-434-11	(G-AEP)...CARBON	27K	5%	1/6W	
R201	1-247-893-00	CARBON	390K	5%	1/6W	
R202	1-249-441-11	CARBON	100K	5%	1/6W	
R203	1-249-425-11	CARBON	4.7K	5%	1/6W	
R204	1-249-425-11	CARBON	4.7K	5%	1/6W	
R205	1-249-429-11	CARBON	10K	5%	1/6W	
R206	1-247-893-00	CARBON	390K	5%	1/6W	
R207	1-249-441-11	CARBON	100K	5%	1/6W	
R208	1-247-903-00	CARBON	1M	5%	1/6W	
R209	1-249-441-11	CARBON	100K	5%	1/6W	
R210	1-249-434-11	CARBON	27K	5%	1/6W	
R211	1-249-433-11	CARBON	22K	5%	1/6W	
R212	1-247-839-00	CARBON	2.2K	5%	1/6W	
R213	1-249-433-11	CARBON	22K	5%	1/6W	
R214	1-247-823-00	CARBON	470	5%	1/6W	
R301 ⚠	1-247-706-11	CARBON	330	5%	1/4W	F
R302	1-247-849-00	CARBON	5.6K	5%	1/6W	
R303	1-247-840-00	CARBON	2.4K	5%	1/6W	
R304	1-247-864-00	CARBON	24K	5%	1/6W	
R305	1-247-805-00	CARBON	82	5%	1/6W	
R306	1-249-423-11	CARBON	3.3K	5%	1/6W	
R307	1-249-429-11	CARBON	10K	5%	1/6W	
R308	1-249-429-11	CARBON	10K	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R309	1-247-801-00	CARBON	56	5%	1/6W	
R315	1-249-417-11	CARBON	1K	5%	1/6W	
R320	1-247-823-00	CARBON	470	5%	1/6W	
R321	1-247-839-00	(G-AEP)...CARBON	2.2K	5%	1/6W	
R322	1-249-417-11	CARBON	1K	5%	1/6W	
R402	1-249-425-11	CARBON	4.7K	5%	1/6W	
R403	1-249-429-11	CARBON	10K	5%	1/6W	
R404	1-247-885-00	CARBON	180K	5%	1/6W	
R405	1-247-885-00	CARBON	180K	5%	1/6W	
R406	1-247-883-00	CARBON	150K	5%	1/6W	
R407	1-247-883-00	CARBON	150K	5%	1/6W	
R408	1-249-425-11	CARBON	4.7K	5%	1/6W	
R409	1-249-425-11	CARBON	4.7K	5%	1/6W	
R410	1-249-425-11	CARBON	4.7K	5%	1/6W	
R411	1-249-425-11	CARBON	4.7K	5%	1/6W	
R412	1-249-441-11	CARBON	100K	5%	1/6W	
R413	1-247-135-00	CARBON	1.5K	5%	1/4W	
R414	1-249-433-11	CARBON	22K	5%	1/6W	
R415	1-249-425-11	CARBON	4.7K	5%	1/6W	
R416	1-249-417-11	CARBON	1K	5%	1/6W	
R417	1-247-853-00	CARBON	8.2K	5%	1/6W	
R418	1-247-849-00	CARBON	5.6K	5%	1/6W	
R419 ⚠	1-247-109-00	CARBON	120	5%	1/4W	F
R420	1-249-429-11	CARBON	10K	5%	1/6W	
R463	1-249-435-11	CARBON	33K	5%	1/6W	
R464	1-249-435-11	CARBON	33K	5%	1/6W	
R502 ⚠	1-206-452-00	METAL OXIDE	3.6	5%	2W	F
R504	1-249-437-11	CARBON	47K	5%	1/6W	
R506	1-249-429-11	CARBON	10K	5%	1/6W	
R602	1-249-417-11	CARBON	1K	5%	1/6W	
R603	1-249-417-11	CARBON	1K	5%	1/6W	
R604	1-249-417-11	CARBON	1K	5%	1/6W	
R605	1-249-417-11	CARBON	1K	5%	1/6W	
R606 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R607	1-249-437-11	CARBON	47K	5%	1/6W	
R608	1-249-414-11	CARBON	560	5%	1/6W	
R609	1-247-829-00	CARBON	820	5%	1/6W	
R610	1-247-817-00	CARBON	270	5%	1/6W	
R611	1-249-435-11	CARBON	33K	5%	1/6W	
R612	1-247-839-00	CARBON	2.2K	5%	1/6W	
R613	1-249-425-11	CARBON	4.7K	5%	1/6W	
R614 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R615	1-249-417-11	CARBON	1K	5%	1/6W	
R616	1-249-414-11	CARBON	560	5%	1/6W	
R617	1-247-833-00	CARBON	1.2K	5%	1/6W	
R618	1-247-817-00	CARBON	270	5%	1/6W	

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ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R619	1-249-433-11	CARBON	22K	5%	1/6W
R620	1-247-839-00	CARBON	2.2K	5%	1/6W
R621	1-249-425-11	CARBON	4.7K	5%	1/6W
R701	1-249-425-11	CARBON	4.7K	5%	1/6W
R702	1-249-405-11	CARBON	100	5%	1/6W
R703	1-249-423-11	CARBON	3.3K	5%	1/6W
R704	1-249-425-11	CARBON	4.7K	5%	1/6W
RV301	1-228-996-00	RES, ADJ, CARBON 47K			
RV302	1-230-630-11	RES, ADJ, CARBON 10K			
RV401	1-230-635-11	RES, ADJ, CARBON 220K			
S701	1-554-303-21	SWITCH, KEY BOARD (MEMORY)			
S702	1-554-303-21	SWITCH, KEY BOARD (1)			
S703	1-554-303-21	SWITCH, KEY BOARD (2)			
S704	1-554-303-21	SWITCH, KEY BOARD (3)			
S705	1-554-303-21	SWITCH, KEY BOARD (4)			
S706	1-554-303-21	SWITCH, KEY BOARD (5)			
S707	1-554-303-21	SWITCH, KEY BOARD (6)			
S708	1-554-303-21	SWITCH, KEY BOARD (7)			
S709	1-554-303-21	SWITCH, KEY BOARD (8)			
S710	1-554-303-21	SWITCH, KEY BOARD (9)			
S711	1-554-303-21	SWITCH, KEY BOARD (0)			
S712	1-554-303-21	SWITCH, KEY BOARD (ENTER)			
S714	1-554-303-21	SWITCH, KEY BOARD (+)			
S715	1-554-303-21	SWITCH, KEY BOARD (-)			
S716	1-554-303-21	SWITCH, KEY BOARD (MEMORY SCAN)			
S717	1-554-303-21	SWITCH, KEY BOARD (FM/MW/LW)			
S719	1-554-303-21	SWITCH, KEY BOARD (AUTO/MANU)			
S901 ⚠	1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)			
T201	1-402-080-11	COIL, ANT (MW)			
T202	1-406-089-11	COIL (OSC)			
T203	1-402-071-11	COIL (ANT)			
T204	1-406-207-11	COIL, LW (OSC)			
T301	1-404-659-11	COIL, DISCRIMINATOR			
T302	1-404-535-11	COIL (WITH IFT)			
T401	1-235-126-00	(G-AEP)...ENCAPSULATED COMPONENT			
T901 ⚠	1-448-422-11	TRANSFORMER, POWER			
TM101	1-536-708-00	(AEP,UK)...TERMINAL BOARD, PUSH 4P			
TM101	1-563-199-11	(G-AEP)....CONNECTOR, PAL			
TM102	1-536-707-00	(G-AEP)....TERMINAL BOARD, PUSH 2P			
TP301	*1-560-060-00	PIN, CONNECTOR 2P			
TP701	*1-560-063-00	PIN, CONNECTOR 5P			
XT701	1-567-125-00	VIBRATOR, CRYSTAL			

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-501-351-21	(AEP,UK)....ANTENNA, FEEDER
1-558-543-21	CORD, CONNECTION
1-558-787-21	(EXCEPT FOR AEP)...CORD, CONNECTION
3-701-630-00	BAG, POLYETHYLENE
3-765-296-11	(AEP,UK).....MANUAL, INSTRUCTION
3-765-296-41	(AEP,230L:G-AEP)...MANUAL, INSTRUCTION
3-765-413-61	(ST-JX4060).....MANUAL, INSTRUCTION
4-876-352-00	SHEET, PROTECTION
4-905-268-01	(AEP)...HOLDER ANTENNA
4-905-240-01	CUSHION, LOWER
4-905-242-01	CUSHION (LEFT), UPPER
4-905-243-01	CUSHION (RIGHT), UPPER
4-905-292-51	(ST-JX230L)...INDIVIDUAL CARTON
4-905-292-71	(ST-JX4060)...INDIVIDUAL CARTON

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